

## **Amendments to the Specification**

*Please replace the paragraph on page 1, lines 4-10 with the following amended paragraph:*

This is a continuation-in-part application of a U.S. Patent Application entitled "IP Packet Ready PBX Expansion Circuit for A Conventional Personal Computer With Expandable, Distributed DSP Architecture", filed 3/2/2000, serial number 09/517,231, now U.S. Patent No. 6,795,448 (Atty Docket PIC-010). This is also a continuation-in-part of a U.S. Patent Application entitled "PBX SOFTWARE STRUCTURE WITH DEVICE ABSTRACTION LAYER FOR DECOUPLING" filed 4/11/2000, serial number xx/xxx,xxx, (Atty Docket PIC-011) which is hereby incorporated by reference.

*Please replace the paragraph on page 1, lines 14-27 with the following amended paragraph:*

One of the problems with PBX on an expansion card technology for personal computers is lack of expandability ~~expandibility~~ to add new ports above and beyond the ports provided by the expansion card. Other problems with prior systems such as Netphone and Altigen systems (Netphone's system is described in U.S. Patent 5,875,234 ~~5,659,005~~) are bottlenecks and latency caused by the use of a single centralized microprocessor to perform voice mail processing, outgoing message generation and other duties for all ports coupled to the card. The Netphone patent does teach time division multiplexed expansion interface 70 which can be used to couple multiple PBX cards like that shown in Figure 2 together by a TDMA PCM highway. This expansion capability allows multiple PBX cards to be coupled together by a TDMA bus. The main PBX card is coupled to the server by an ISA bus interface 60. An ISA bus is a slow 16-bit, master-slave type system bus used on older personal computers such as the IBM AT. An ISA bus can only transfer one word at a time between the PBX card and the host server. It is not particularly well adapted for bursting large amounts of data over a short time such as is required to playback or record voicemail recordings.

*Please replace the paragraphs on page 6, lines 14-16 with the following amended paragraph:*

Figures 8A through ~~[[8B]]~~ 8C are a flowchart of the process the microcontroller in each port expansion unit carries out to interface with

the telephone line interface circuits such as 122 in Figure 1 for an incoming call.

*Please replace the paragraph on page 11, lines 13-19 with the following amended paragraph:*

The DSP is coupled by another local TDMA bus 44 to an external interface FPGE 46. The external interface 46 is shown in block diagram form as Figure 2. The external interface has buffers 64 to buffer the timeslot data ~~traveling travelling~~ in both directions to and from the PEU card 66 ~~[[52]]~~ on TDMA extension buses 40, 44, 48 and 50. There is an FPGA interface circuit 46 on each switch card and an FPGA interface circuit 104 on each PEU. The functionality of each of these FPGA types is described below in VHDL language in Appendices A and B.

*Please replace the paragraph on page 11, line 20 to page 12, line 7 with the following amended paragraph:*

The PEU 66 is comprises of one or more port expansion unit circuit boards (hereafter referred to as a card) of which cards 66, 70, 72 and 74 are typical. Each PEU card has one or more ports for coupling to CO POTS trunk lines, T1, ISDN or DSL lines or lines to extension phones. The PEU cards do not use up expansion slots in the ~~[[host]]~~ ~~personal~~ computer 10 ~~[[68]]~~. Each PEU card is coupled to its neighboring PEU cards by a TDMA bus 50 and a packet switched bus 54 to form a daisy chain. The first PEU in the chain is coupled to the ~~[[server 68]]~~ ~~personal computer 10~~ by a TDMA bus 50 and a packet switched bus 54. The significance of this architecture is that the system can be easily expanded to grow to as many extension phones and CO POTS trunk lines and T1 or DSL lines as needed to meet the needs of the customer while using a conventional personal computer with only a limited number of expansion slots as the server. In addition, it is new to have a packet switched bus interface in each PEU and it is also new to use the packed switched bus for voice mail traffic. Prior art PBX on a card type circuitry uses the TDMA path and the switching resource to couple the voice resources such as voice mail files stored on the hard disk to the codecs at the ports. Typically, only a fixed number of TDMA channels are devoted to voicemail traffic, so when those channels are all busy, the system has a bottleneck and other ports cannot play or record voicemail. This centralized limitation of voicemail channels to some fixed number severely limits the expandability of the system in terms of the number of extension telephones, T1, ISDN or DSL lines or CO POTS lines which can be coupled to the system.

*Please replace the paragraph on page 36, line 17 to page 37, line 2 with the following amended paragraph:*

Referring to Figure 8, comprises of Figures 8A through 8C [[and 8B]], there is shown a flowchart of the process the MC carries out to interface with the telephone line interface circuits such as 122 in Figure 1. Step 287 represents the process of reading configuration data sent to the MC from the PBX at startup time and setting DID switch 202 (Fig. 6) in the telephone interface 122 (Fig. 1) as appropriate. Each port has a switch 206 that is manually manipulated by the installer when the system is set up that tells whether a port is coupled to a CO line or an extension phone. The MC has a process which periodically reads this switch to determine the configuration of each port. This process sends a configuration packet for each port to the DSP which records that data. In alternative embodiments, the DSP need not send back the configuration data packets to the MC because it already knows the configuration of the ports. The DID switch must be in a position to couple the current feed circuit 200 to the transformer 204 when the port is coupled to a CO line to support DID signalling. In certain forms of DID, the PBX signals that it is ready to receive the call by sending loop current back to the CO with the tip voltage polarity reversed from negative to positive 48 volts relative to ring by tip and ring reversal circuit 186. If the port is coupled to an extension phone, switch 202 is set by the MC so that the current feed circuit is no coupled to the transformer.